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First record of *Piper robustipedunculum* Yunck. (Piperaceae) in the state of Pernambuco, Brazil

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Abstract

Piper L. is the largest genus of Piperaceae with about 2,000 species worldwide. Brazil is home to 466 of these species. They are found mainly in the Atlantic and Amazonian forests. This is the first record of *Piper robustipedunculum* Yunck in the state of Pernambuco, a species which was previously considered restricted to the state of Bahia. We consulted the herbaria CEN, HAMAB, HEPH, IBGE, IPA, MAC, R, RB, RFFP, UB, UFP, UFMT, UPCB and the virtual speciesLink and Reflora databases. Additionally, we elaborated a description and a distribution map to the species.

Keywords

Atlantic Forest, Brazilian endemism, chorological novelty, forest remnant, morphological description, range extension, São Vicente Férrer.

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Introduction

Piperaceae has a pantropical distribution with about 3,700 species belonging to five genera, namely *Manekia* Trel., *Peperomia* Ruiz & Pav., *Piper* L., *Verhuellia* Miq., and *Zippelia* Blume (Jaramillo et al. 2004; Wanke et al. 2006). However, only the first three genera aforementioned occur in Brazil, with a total of 466 species which are predominantly distributed in the Atlantic and Amazon forests (Flora do Brasil 2020). According to APG (2016), Piperaceae is part of the Magnoliid clade, order Piperales, along with Aristolochiaceae and Saururaceae.

Piper is the largest genus of the family with about 2,000 species worldwide (Jaramillo et al. 2004). Of these, 291 taxa are reported to Brazil, 184 of which restricted to the country. The Atlantic Forest and the Amazon are home to the largest number of taxa, with 122 and 82 respectively (Flora do Brasil 2020). About 10% of the species of *Piper* (28 species) present in Brazil are found in the state of Pernambuco (Flora do Brasil 2020).

Piper robustipedunculum was described by Yuncker (1966) based on the collection Wawra & Maly 158 from the island of Itaparica, Bahia, and deposited in the herbarium of the Naturhistorisches Museum Wien (W). Later, Yuncker (1973) republished the previous description of the species in his work on Brazilian species. It is important to mention that Yuncker worked with a single material, which is why the author was unable to contemplate

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the taxon morphology in more detail. Thus, this study aims to expand the knowledge of *P. robustipedunculum*, providing a more detailed description and expanding its distribution to the state of Pernambuco, Brazil.

Methods

Plant material was collected and photographed during an expedition to the municipality of São Vicente Férrer, Pernambuco, in October 2019. We prepared voucher specimens according to the usual botanical collection techniques and deposited the material in the herbarium of the Museu Nacional, Universidade Federal do Rio de Janeiro (R) (acronyms follow Thiers et al. 2020).

For species distribution, we consulted the virtual databases Reflora (http://reflora.jbrj.gov.br/reflora/herbarioVirtual/) and speciesLink (http://www.splink.org.br/), and the following herbaria: Herbário da Embrapa Cenargen, Brasília (CEN), Herbário Amapaense, Amapá (HAMAB), Herbário Ezechias Paulo Heringer, Jardim Botânico de Brasília (HEPH), Herbário do Instituto Brasileiro de Geografia e Estatística, Brasília (IBGE), Herbário Dárdano de Andrade Lima, Instituto Agronômico de Pernambuco (IPA), Herbário do Instituto do Meio Ambiente do Estado de Alagoas (MAC), Herbário do Museu Nacional (R), Herbário do Jardim Botânico do Rio de Janeiro (RB), Herbário da Faculdade de Formação de Professores da Universidade do Estado do Rio de Janeiro (RFFP), Herbário da Universidade de Brasília (UB), Herbário Geraldo Mariz, Universidade Federal de Pernambuco (UFP), Herbário da Universidade Federal de Mato Grosso (UFMT), and Herbário do Departamento de Botânica, da Universidade Federal do Paraná (UPCB).

A map was prepared using QGIS 2.16.3 (QGIS Development Team 2020) and was based on herbarium records (CEPEC 34569, HUEFS 149841, NY00251714, RB00303688, RB00303895, RB00535445, RB00565001, RB00625524, RB00674321, RB00674323, RB00791840). However, due to the proximity between the collections and the map's resolution, the number of dots is inferior to the material consulted. The taxonomic description is based on all the material listed above and followed Radford et al. (1974).

Results

***Piper robustipedunculum* Yunck.**, 1966; Boletim do Instituto de Botânica 3: 120–121.
Figure 1

New record. BRAZIL• Pernambuco, São Vicente Férrer, Mata do Estado, Caidor fragment, Siriji riverbank; 07° 36′51″S, 035°30′53″W; 16 Oct. 2019; G.A. Queiroz et al. 664 col.; R 239947).

Description. Erect shrub, 1.5–4 m tall; branches 0.2–0.4 cm in diameter, striate, sulcate, not glandular, glabrous. Leaves with petiole 0.6–2.2(–2.5) cm long, striate, sulcate, not glandular, not alate, glabrous; sheath elongate, throughout the petiole, sometimes extending over the base of the blade; leaves 19–28.2(–30) × 7.2–11.5 cm, green, discolor, membranaceous, opaque, glandular, oblong-elliptical, ovate-lanceolate, base subsymmetric, obtuse or cordulate, one side 2–3 mm shorter than the other side, margin revolute, not ciliate, glabrous on both sides, apex acute, acuminate; venation brochidodromous; secondary ribs protruding from the abaxial face, alternate, 8–14 upward pairs towards the apex of the blade and arranged up to the fourth part or up to the apex. Spikes 5.8–12.5 × 0.4–0.6 cm, apiculate 1–3 mm long, rachis striated, not glandular, glabrous; peduncle 1.9–4 cm long, not bracteate, wider towards the spike, striated, sparse glands, glabrous; prophyll 2–4.2 × 0.8–1 cm lanceolate, apex acute, not glandular, not ciliate, glabrous; floral bract triangular, subpeltate, margin glabrous or sparsely fringed, glandular, glabrescent or pilose at the base; four stamens; ovary with short or sessile style, three stigmas. Fruits 1–2 mm × 2–2.5 mm forming 11–37 banding patterns, trigonous or rarely tetragonous, glandular, apex depressed, laterally tripartite, glabrous.

Discussion

Piper robustipedunculum is characterized by a floral bract triangular, subpeltate, glabrescent or pilose at the base, spikes 0.4–0.6 cm diameter, peduncle 1.9–4 cm long, wider towards the spike. It is morphologically similar to *Piper amplum* Kunth, which presents floral bract lunar, cucullate, the pedicel the angles pilose, spikes 0.15–0.4 cm diameter, peduncle 0.8–1.5 cm long, not wider towards the spike.

Otroski et al. (2018) stated that *P. robustipedunculum* is endemic to the Atlantic Forest (Dense Ombrophilous Forest), occurring only on the south coast of Bahia, where it occurs in the Pratigi Environmental Protection Area (municipalities of Igrapiúna, Ituberá, Nilo Peçanha, Ibirapitanga and Piraí do Norte), Serra das Lontras National Park (municipalities of Arataca and Una), Itaparica island, and in the municipality of Itacaré (Fig. 2). However, this new record in Pernambuco shows that the species occurs outside of this range. The expansion in the distribution of this species probably dates back to the period when the Atlantic Forest was a continuous vegetation. However, an intensive devastation led to the loss of more than 80% of the cover, leaving it highly fragmented (Ribeiro et al. 2011).

The forest fragment in which this material was collected, namely Mata do Estado, has about 600 ha and 600–640 m a.s.l. in elevation (Beltrão and Macedo 1994). About 10 individuals were observed, most along trails or near streams, showing their likely preference for this environment. This new record expands the extent of occurrence of *P. robustipedunculum* from 1,9 km^2 to 41,4 km^2. However, we identified only 11 records of this taxon in herbariums with the last collection dating to 2013. These data reinforce the importance of conserving

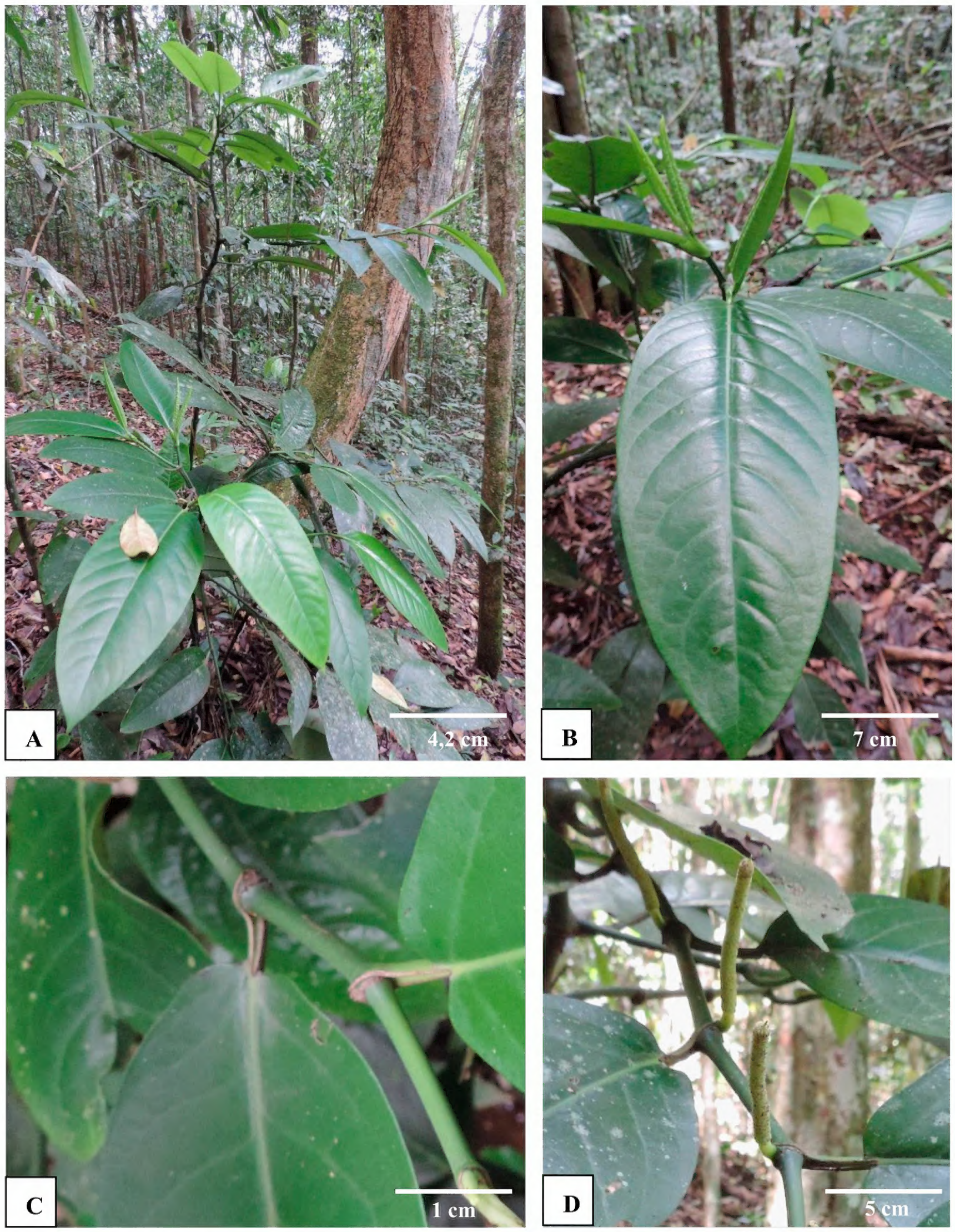

Figure 1. *Piper robustipedunculum* Yunck. **A.** Habit. **B.** Leaf blade. **C.** Leaf base showing the petiole with a long sheath. **D.** Spike.

fragments of vegetation that can harbor species of interest for conservation (Sobral-Leite 2011).

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Authors' Contributions

GAQ wrote the manuscript with the support of EFG and CMS. GAQ collected and photographed the material. GAQ, EFG and CMS wrote the Identification section and elaborated the map. All authors gave suggestions on the text and checked the final version of the manuscript.

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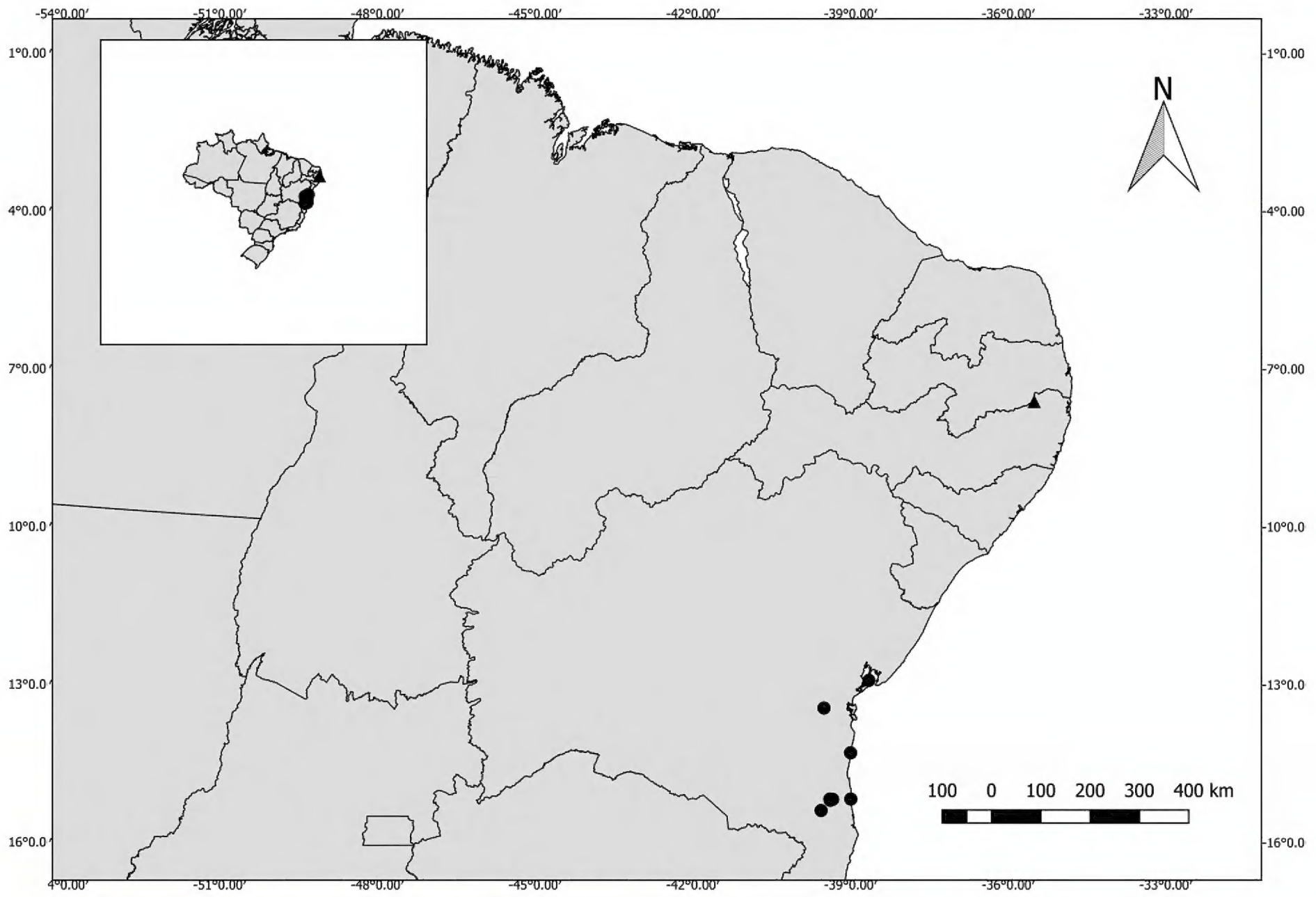

Figure 2. Geographic distribution map of *Piper robustipedunculum* Yunck. (black circles: previous occurrence records; black triangle: first record of the species in Pernambuco, Brazil).

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